EXECUTIVE SUMMARY

Surrounded by the highly developed and densely populated cities of Los Angeles, Culver City and Inglewood, the Baldwin Hills represent the largest remaining expanse of open space (about 1200 acres) in the Los Angeles Basin. Ascending to just over 500 feet above the coastal plain, the Baldwin Hills are a series of north-south trending hills whose north and west flanks rise abruptly from the flat terrain and slope gently toward the south and east.

Within the remaining natural areas, stands of a unique southern California vegetation association, coastal scrub, still exist on many of the canyon slopes. Because modern human activities throughout southern California have greatly reduced this plant community to just a fraction of its historic range, the coastal scrub in the Baldwin Hills represents the largest, and therefore most significant, remaining expanse of this plant community within the Los Angeles Basin. Despite their fragmented and often degraded condition, these areas still provide important natural habitat to several species of birds and mammals that do not occur in the surrounding urbanized lowlands. These coastal scrub animals include birds such as the California Quail, Bewick's Wren, and Spotted Towhee, and mammals such as the Desert Woodrat, Deer Mouse, and Harvest Mouse.

Flanking the northwestern portion of the Baldwin Hills, the now channelized Ballona Creek is the most important drainage associated with the Hills. The coastal scrub of the Baldwin Hills represents the last remaining natural habitat within the middle and lower portions of the Ballona Creek Watershed. This close juxtaposition firmly establishes the Baldwin Hills as an integral component of the Ballona Creek Watershed.

To aid regional park planning efforts by state and local agencies to acquire and restore additional parklands and natural open space in the Baldwin Hills surrounding the existing Kenneth Hahn State Recreation Area (KHSRA), the Natural History Museum of Los Angeles County, in 2000, conducted qualitative surveys of the biological resources of the Baldwin Hills and examined their relationship to surrounding drainages, including Ballona Creek and the Ballona Wetlands. Because a broad mix of land uses and ownership occurs in the area, our surveys were restricted to the accessible portions of the Hills, primarily to those within the 350 acre KHSRA. These ground surveys were supplemented with the examination of current, high resolution aerial images of the entire area to qualitatively evaluate the natural vegetation associations throughout the Baldwin Hills.

In this report we provide an overview of the existing vegetation communities and animal populations associated with them, and piece together from scant available information an historical overview of the area's natural landscape. Additionally, we make preliminary recommendations for the preservation of relatively intact coastal scrub remnants and for the rehabilitation and restoration of other degraded sections. We

identify potential linkages of natural and restorable habitat within the Baldwin Hills, and between the Hills and the downstream habitats of the Ballona Wetlands.

PLANT COMMUNITIES

The major natural vegetation community (a group of plant species coexisting in a particular place) present in the Baldwin Hills is coastal scrub. Additionally, extensive areas are covered by annual grasslands; these are generally lacking in native grasses, instead being dominated by Old World grasses and annuals (individual plants that live for only a single season). Along some drainages a shrubby riparian (streamside) woodland dominated by Arroyo Willow and Mule Fat occurs. No endangered or threatened plant species were detected on our surveys.

Coastal Sage Scrub

Coastal sage scrub, once a prominent natural plant community now imperiled throughout southern California, is typically characterized by several perennial species (plants persisting for many years) of native sage, California Sagebrush, California Buckwheat, Coyote Brush and Bush Sunflower. Growing on slopes of low elevation, this vegetation association is tolerant of drought and adapted to frequent fire.

The coastal sage scrub found in the KHSRA and surrounding areas is presently dominated by California Sagebrush and Coyote Brush. Bush Sunflower is locally abundant, particularly in canyons on the west side of the KHSRA. However, the other important components of coastal sage scrub, including native Black Sage, White Sage and California Buckwheat, have been infrequently observed in the study area over the last several decades, leading some workers to suggest that the present scrub community is one of disclimax, a community wherein many native species have largely been replaced by introduced (non-native) species.

Because of the absence of dominant sage species of the genus *Salvia*, the scrub communities of the Baldwin Hills are more aptly termed "coastal scrub". Despite the trend in species turnover observed over much of the undeveloped areas of the Baldwin Hills, several important expanses of coastal scrub persist along the east side of KHSRA and along the western side of the Hills near the Holy Cross Cemetery and West Los Angeles College. Their large size and relatively pristine condition make these areas especially attractive candidates for preservation and restoration efforts.

Grassland/Coastal Prairie

Throughout California, native grasslands were originally characterized by perennial bunch grasses and a variety of annual plants including poppies, tarweeds, and lupines. Due to early historical land use practices such as livestock grazing, these habitats have now been largely transformed into grasslands composed of various introduced species. In the Los Angeles Basin, there is some debate as to what extent native grasslands had historically occupied the sites of our present day non-native grasslands, since introduced exotic grasses and other annual species also often replace native scrub that has been disturbed or removed. However, scant documentation is

available of the natural landscape of the Baldwin Hills prior to the extensive cattle grazing of the late 1800s. A few native bunch grass species have recently been found to persist in the Baldwin Hills; these, and the presence of several species of native annually flowering plants, suggest that perhaps perennial grasslands or prairie did historically occur in the area. Today, zones of grassland occur primarily on ridge tops and low saddle areas within the KHSRA. These areas are overwhelmingly dominated by exotic grasses and other plants that originated from the Mediterranean region.

Riparian

Native riparian or streamside communities in southern California typically consist of large alder, willow, sycamore and cottonwood trees intermixed with shorter stands of willow and mule fat. Historically the larger drainages in the Baldwin Hills must have supported some riparian growth, and riparian woodland was extensive in the bottomlands of Ballona Creek and its tributaries. Because no significant natural watercourses presently flow through the Baldwin Hills, the existing patches of riparian habitat are supported, in large part, by landscape maintenance or its runoff. In the study area, zones of streamside vegetation are more accurately described as urban riparian. Compared to more natural riparian woodlands, these zones are reduced in extent and species composition, and exhibit a shrubby growth form. Species representing native riparian habitats, such as Arroyo Willow and Mule Fat, commonly occur along moist canyon bottoms within the KHSRA and elsewhere in the hills.

ANIMAL COMMUNITIES

Arthropods (insects and related groups)

The diversity of arthropod populations is generally dependent upon plant diversity. Because many insects specialize on one or a few closely related species of plants, they are often limited by the densities and distributions of the host plant species upon which they feed. The most important habitat in the Baldwin Hills for insects is coastal scrub.

Our survey results indicated the presence of many cosmopolitan and introduced species of arthropods within the Baldwin Hills. These include some 48 species of beetles, 15 species of bees and non-parasitic wasps, and 15 spiders. Additionally, 12 species of butterflies have been identified and up to 33 are expected to occur; all but one are native. Nearly 60% of these feed on a variety of common landscaping plants. The remainder feed upon a narrow range of hosts that are not well represented in the Baldwin Hills. No endangered or threatened species have been encountered.

At this time the insect fauna of the Baldwin Hills appears to be dominated by species common to much of southern California and often encountered in urban areas. The scarcity of arthropods that are typical of coastal scrub is not surprising as several key plant species of that vegetation association are absent entirely, or are so poorly represented in the Baldwin Hills as to be ecologically insignificant. At least two species of ants, the introduced and invasive Argentine Ant and the native Thief Ant are also present in the Baldwin Hills. Exotic arthropods such as the Argentine Ant, Pill Bug, and

the European Earwig were the most abundant species in pitfall trap samples. These species compete with and displace native insect populations or, in the case of the pill bug and earwig, may also prey upon the eggs and larvae of native species. Based on comparisons made with an arthropod study of coastal scrub on the Palos Verdes peninsula, the arthropod community of the Baldwin Hills reflects a natural habitat that has been subjected to extensive modification.

Reptiles and amphibians

A checklist of reptiles and amphibians encountered in the Baldwin Hills includes 12 species, six of which were observed during the current survey. Several additional species are likely to occur. All of these except the one turtle species encountered (Red-eared Slider) are native to California. The species encountered most frequently were the Side-blotched Lizard and Western Fence Lizard. No endangered or threatened reptiles or amphibians were observed.

The composition and abundance of amphibian and reptile populations are directly related to the amount of suitable habitat present. Populations of the native Coast Horned Lizard, an animal that is often associated with coastal scrub, are declining over much of its range. This lizard has not been known to occur historically in the Baldwin Hills. The areas in the Baldwin Hills that support native vegetation are often fragmented and have been degraded by the invasion of introduced plant species. These invasions reduce the quality of such habitats for native amphibians and reptiles by altering protective cover, often increasing the vulnerability of such organisms to native and introduced predators, such as feral dogs and cats (domestic species which have reverted to living in a wild state).

The Black-bellied and Garden slender salamanders, known from previous studies of the Baldwin Hills, were not encountered during the present study. Their absence may be indicative of continued habitat degradation or may have been influenced by low rainfall experienced during the year of the study. No natural aquatic habitats (e.g. ponds, streams), occur within the study area; the artificial lake and streams that are currently present provide low quality habitat for native amphibians.

Birds

A checklist of the birds of the Baldwin Hills includes 166 species of which about 41 (36 native) currently nest there; eighteen additional species may breed occasionally or bred formerly. The remaining species are seasonal visitors that breed elsewhere. Eight introduced (non-native) species account for 5% of the area's species richness. No threatened or endangered species were encountered during the present survey. The Tricolored Blackbird, a California State Species of Special Concern, has been observed in the Baldwin Hills on occasion. Among the currently breeding species are three which require coastal scrub and are therefore absent from the surrounding urban lowlands: California Quail, Bewick's Wren and Spotted Towhee.

Significant historical changes in the avifauna (birdlife) of the Baldwin Hills have occurred, although the record of birds there prior to the 1970s is poorly documented.

Bird abundance is high in degraded habitats with exotic annual vegetation and in landscaped parklands, but resident species that are mostly restricted to the native coastal scrub and riparian habitats generally occur in low numbers. The Greater Roadrunner and Burrowing Owl no longer occur in the Baldwin Hills, and the Cactus Wren and California Thrasher have possibly also been lost from the suite of species that were resident there. Formerly breeding species of the Baldwin Hills which now only occur as non-breeding visitors include the Loggerhead Shrike and Blue Grosbeak. The decline in populations of species which are dependent on native habitats is likely due to habitat loss and degradation and the impacts of native and non-native predators such as feral cats and dogs, raccoons, gray foxes, fox squirrels, and jays, crows and ravens.

Mammals

A checklist of mammals encountered in the Baldwin Hills included 18 species, although up to 10 additional species (mostly bats) could occur. During the current survey 14 species of mammals were detected, of which nine are native to California. Four native species detected during previous investigations in 1975 and 1978, but not during the present study, included the Coyote, Western Spotted Skunk, California Ground Squirrel, and California Vole. Our investigations focused on the terrestrial fauna and as such were not sensitive to the detection of bats. Although we did examine some potential roost sites for deposits of guano, we found no indication that bats used natural or man-made structures with any obvious regularity. No endangered or threatened mammal species were encountered. California state species of special concern that could potentially occur in the Baldwin Hills include the Pallid Bat, Western Mastiff Bat, and the Los Angeles Pocket Mouse.

The large mammals encountered in the Baldwin Hills included the Gray Fox, Raccoon, Striped Skunk, and feral dogs and cats. Except for the fox, all adapt easily to, and benefit from, living in proximity to human populations. Species of rodents found in the Baldwin Hills included the introduced fox squirrel, native pocket gophers, woodrats and mice, and the introduced house mouse. Two native species of rabbit and the introduced opossum are also present in the Baldwin Hills.

The present composition of the mammal community in the Baldwin Hills appears to largely reflect the surrounding urban area; only the fox, native rodents, and the jackrabbit have close associations with native scrub habitats. The apparent loss of a top predator, the Coyote, has important ramifications for the health of the entire coastal scrub community as the presence of such predators keeps populations of smaller predators, such as foxes and feral cats, in check. It is these populations of smaller predators ("mesopredators") that unduly impact populations of small birds and other small vertebrates.

PRELIMINARY CONSERVATION RECOMMENDATIONS

Several relatively large and intact sections of coast scrub occur within the KHSRA and elsewhere in the Baldwin Hills. These form the backbone of what could be an extensive network of natural habitats within the Hills. Basic tenets of wildlife habitat conservation dictate that larger tracts of natural habitat and maximized connections to

other large tracts provide the greatest habitat values to wildlife. Although conservation efforts in the Baldwin Hills may be constrained by conflicting land usage's and the intensity of surrounding urbanization, we offer the following recommendations.

- **Existing Habitat Preservation.**
  The most important issue impacting the diversity of native animals in the Baldwin Hills is the loss or modification of natural coastal scrub habitats. Recent and continuing fragmentation and degradation of coastal scrub has occurred as a result of oil extraction activity, park development, landscaping, and trail establishment. Maintenance of the biodiversity of the Baldwin Hills requires, first and foremost, a vigorous program to protect all existing areas of intact habitat from further removal, fragmentation, and degradation by harmful activities such as vegetation clearing, the dumping of debris, adjacent landscaping, off-trail intrusions, and unnatural fire regimes. Recent research has indicated that restored tracts of degraded coastal scrub lack the arthropod diversity found in healthy tracts of such habitat, underscoring the importance of preserving existing habitat.

  The continued degradation and removal of coastal scrub habitat will certainly promote the loss of a number of animal species that depend on them. The loss of an important predator, the Coyote, has apparently already occurred in the Baldwin Hills. Several bird species on the verge of elimination (if not yet extirpated) include the Cactus Wren, California Thrasher, and Rufous-crowned Sparrow. Continued habitat loss and fragmentation in the future will also likely cause the ultimate loss of the still relatively common species requiring coastal scrub such as California Quail, Bewick's Wren, Spotted Towhee, in addition to populations of native reptiles and rodents.

- **Habitat Restoration.**
  Our study has established broad-scale criteria for setting priorities for habitat conservation. Using these we have identified several areas throughout the Baldwin Hills that, although presently in degraded condition, appear to possess moderate to high restoration potential and would serve to link areas of intact coastal scrub. Although, as noted above, habitat restoration is not a panacea, such efforts can be critical in optimizing habitat size and connectivity. The restoration of many areas of coastal scrub may be achieved through:

  - Removal of invasive exotic plants and replacement with native plant species
  - Application of appropriate soil treatments
  - Elimination of the detrimental impacts of artificial water regimes used to maintain the surrounding park and residential landscapes.

- **Control of Mesopredators.**
  An unnaturally high concentration of feral cats, dogs, and other mesopredators (medium-sized predators which thrive in the absence of large carnivores such as Coyotes) threatens ground-inhabiting birds, small mammals, reptiles and amphibians in the Baldwin Hills. An active program to control feral predators, perhaps coupled with the reintroduction of the dominant native predator, the Coyote,

should be initiated. The establishment of feeding stations for feral cats has recently been observed in the KHSRA. Such practices that provide unnatural sources of food for feral cats and dogs, opossums and skunks should be eliminated immediately.

- **Connect Natural Habitats**.
  In addition to connecting areas of intact coastal scrub habitat within the Baldwin Hills through targeted habitat restoration, consideration should be given to restoring some degree of connectivity between the Hills and other natural open spaces.

  Historically, coastal scrub habitats in the Baldwin Hills were probably separated from those of the Palos Verdes Peninsula, Santa Monica Mountains, and hills of the eastern Los Angeles Basin by other natural habitats with few woody plant species such as freshwater marshes and grasslands, in essence imparting a natural island effect to the Baldwin Hills. Riparian corridors can serve as linkages between upland areas of coastal scrub, but such corridors may not have existed in sufficient form to extensively link the Baldwin Hills to other upland areas. Natural connections between the Baldwin Hills and the wetlands near the mouth of the Ballona Creek system were essentially severed with the creek's channelization. Large-scale urbanization has only intensified the isolation of the Baldwin Hills from other natural habitats such as those in the Santa Monica Mountains.

  However, many bird species and a few large mammals show fair to excellent dispersal abilities, and could potentially utilize reconstructed linkages between the Baldwin Hills and the coastal wetlands. Such linkages, coupled with the reintroduction of coyotes, might help restore a more balanced suite of mammalian predator species in the Baldwin Hills/Ballona Creek and wetlands region.

- **Education**. Additional studies of the area's restoration potential and its implementation can provide unique and rewarding opportunities for education and community involvement. Educating the public about the natural plant and animal communities of our region could promote a greater awareness of the natural world and man's role in shaping it, along with the more immediate benefit of increasing respect for and protection of the natural habitats within the Baldwin Hills.

CONCLUSION

In summary, the composition of the vegetation and animal communities that currently exist in the Baldwin Hills forms a modified subset of typical communities of less disturbed natural habitats. These modifications are a direct result of early and ongoing large-scale alterations of the Baldwin Hills that included livestock grazing, cultivation, oil extraction, and urbanization. Recommendations for improving species diversity and restoring populations of coastal sage scrub animal species include: complete and immediate protection of existing coastal scrub habitat which includes minimizing human impacts into certain large intact sections of natural habitat, restoration of degraded coastal scrub (especially to provide linkages between tracts of intact habitat), removal of exotic predators, reintroduction of coyotes, and, where practicable, reintroduction of native animal species that formerly existed in the Baldwin Hills.